

# SPECIFICATION

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## [CHEST VIBRATING DEVICE]

### Background of Invention

- [0001] The present invention generally relates to devices used to for people with Cystic Fibrosis or other lung conditions which obstruct air ways and the lungs. More specifically, the present invention relates to a chest device which produces vibrations in the chest area to loosen obstructions in air ways and the lungs.
- [0002] Most devices on the market to relieve the congestion of lungs are driven by air pressure for the creation of vibration. These devices are usually big on the user and create mobility problems for the user. Finally, these devices are not directed to the bottom lobes of the lungs, where most infections begin.
- [0003] It is an object of the present invention to provide device which produces a vibration to loosen obstructions in air ways and the lungs which is self contained and allows mobility of the user.

### Summary of Invention

- [0004] A chest vibrating device including a frame, shoulder pads, chest pad and back pad. The frame being configured to fit around an upper body of a user. The shoulder pads extending from the frame to rest the frame on shoulders of the user. The chest pad extending from a front inside of the frame towards a chest of the user. The back pad extending from a rear inside of the frame towards a back of the user. The vibrating unit attached to the frame which produces a vibration that travels from the vibrating unit, through the frame onto the chest pad and at least one back pad.

### Brief Description of Drawings

- [0005] Fig. 1 is a perspective view of a chest vibrating device according to the present invention;

- [0006] Fig. 2 is a front view of a chest vibrating device according to the present invention;
- [0007] Fig. 3 is a partial rear exploded view of a chest vibrating device according to the present invention;
- [0008] Fig. 4 is a partial cutaway perspective view of a hinge and shoulder pad according to the present invention;
- [0009] Fig. 5 is a partial perspective view of a clamping unit according to the present invention;
- [0010] Fig. 6 is a partial perspective view of a female version chest pad according to the present invention; and
- [0011] Fig. 7 is an exploded view of a vibrating unit according to the present invention.

## Detailed Description

- [0012] The present invention is a chest vibrating device 10 which is attached to the user, as shown in Figs. 1-7. The chest vibrating device 10 includes a frame 12, chest pad 16, back pads 18, shoulder pad 20, clamping unit 22 and vibrating unit 24. The chest vibrating device 10 vibrates and transfers vibrations to the lungs of the user. This clears the lungs by loosening obstructions in the air ways. The chest vibrating device 10 is fully adjustable to fit all sizes and can be fitted for both male or female users. The chest vibrating device 10 can be used for people with Cystic Fibrosis or other lung conditions with obstructed air ways.
- [0013] The frame 12 includes a left arm, right arm, cross-member 30 and clamp support 32. The left and right arms 26, 28 each include back pad rails 34 and housing rail receivers 36. As shown in Fig. 3, each back pad rail 34 extends from a inside surface of the left and right arms 26, 28 at the rear half 38 of the frame 12 to connect to the back pads. Each back pad rail 34 includes a plurality of holes 40 along the back pad rail 34. Each housing rail receiver 36 is a pair of rails 42 extending outward from the left and right arms 26, 28 at the rear half 38 of the frame 12 and includes a plurality of aligned holes 44. The left and right arms 26, 28 each include a hinge 46 along their length at about the half way point, as shown in Figs. 1-2 and 4. The hinges 46 allow the opening and closing of the frame 12 for entrance by the user. Fig. 4 shows the

employment of a ball hinge 48 and a flexible hinge cover 50. The hinge cover 50 is used to reduce wear, for looks and for safety of the user. The cross-member 30 is attached to the front half 52 of the left and right arms 26, 28. As shown in Fig. 1, the cross-member 30 includes holes 54 to allow the adjustment of positioning of the left and right arms 26, 28. Fasteners 56 are used to attach the cross-member 30 to the left and right arms 26, 28. The left and right arms 26, 28 also include clamp supports 32 attached to the rear half 38 of the left and right arms 26, 28. The clamp supports 32 extend from the rear and towards the front of the frame 12. A clamping unit 22 is attached to the cross-member 30 and the clamp support 32 on each side of the frame 12. The clamping unit 22 is fully adjustable to various size users. The clamping unit 22 shown in Figs. 1-2 and 5-6 is similar to belt-buckle combinations used in ski boots and in-line skates.

[0014] Figs. 1-2 show a male version of the chest pad 16 and Fig. 6 shows a female version of the chest pad 60. The male chest pad 16 is mounted to the inside front half 52 of the left and right arms 26, 28 using fasteners 62 and rubber mounts 64. The male chest pad 16 is sized such that the chest pad 16 extends down to vibrate the lower lobes of the lungs. The female chest pad 60 includes an upper pad 66, lower pad 68 and pad bar 70. The upper pad 66 is connected to the top of the pad bar 70. The lower pad 68 is connected to the bottom of the pad bar 70. The pad bar 70 includes adjustment holes 72 and is connected to the cross-member 30 using fasteners 74 and rubber mount 76. The upper pad 66 is sized to produce vibrations in the top of the lungs. The lower pad 68 is sized to produce vibrations that reach not only the front of the lower lungs, but also the sides of the middle and lower lobes. The pad bar 70 is curved to wrap around the chest of a female.

[0015] The back pads 18 are sized to reach from the upper to the lower lobes of the lung. The back pads 18 include back pad rail receivers 78, as shown in Fig. 3. Each back pad rail receiver 78 is a pair of rails 80 extending outward from the rear of the back pads 18 and includes a plurality of aligned holes 82. The back pads 18 are mounted to the left and right arms 26, 28 by sliding the back pad rails 34 between the rails 80 of the back pad rail receiver 78. Then, one of the holes 40 of the back pad rail 34 is aligned with a set of aligned holes 82 of the back pad rail receiver 78 and a fastener 84 is inserted to secure the back pads 18 to the left and right arms 26, 28. The

shoulder pads 20 are curve shaped to fit over the shoulders of the user and include shoulder pad supports 86, as shown in Figs. 1 and 4. The shoulder pad 20 are designed to transfer the weight of the invention to the shoulders of the user. The shoulder pads 20 should be padded for comfort of the user. Fig. 1 shows the shoulder pad supports 86 attached permanently using a technique such as welding, while Fig. 4 shows the shoulder pad supports 86 mounted between two plates 88 extending from the left and right arms 26, 28. The mounting as shown in Fig. 4 includes holes 90 through the two plates 88 and the shoulder pad support 86 and fasteners 92 are used to connect the two plates 88 and the shoulder pad support 86. The chest pad 16, back pads 18 and shoulder pads 20 can include a coating that molds to the shape of the user for comfort.

[0016] The vibrating unit 24 is shown in Figs. 1–3 and 7. The vibrating unit 24 includes a housing 94, housing rails 96 and vibrator 98. The vibrator 98 is show as a motor 100 which rotates an off-set weight 102 to cause vibrations. The motor 100 is usually of the type that runs on twelve Volt DC or one-hundred-and-twenty Volt AC. The motor 100 is mounted to the inside back 104 of the housing 94. The housing 94 includes a housing cover 106 for safety. The housing rails 96 extend outward and along the outside back 108 of the housing 94. The vibrating unit 24 is mounted to the frame 12 by inserting housing rails 96 between the rails 42 of the housing rail receivers 36 of the left and right arms 26, 28, and fastening using fasteners 110 through holes 97. The vibrations generated by the vibrator 98 are transferred through the housing 94 and the housing rails 96 onto the frame 12 and then to the chest and back pads 16, 18.

[0017] The operation of the chest vibrating device 10 is as follows. The user adjusts the position of the left and right arms 26, 28 along the housing rails 96 and cross-member 30 for proper sizing. The user lifts the front half 52 of the left and right arms 26, 28 upward along the hinges 46 to enter the frame 12. Then, the user slips into the frame 12 and closes the front half 52 of the left and right arms 26, 28 along the hinges 46. Finally, the user uses the clamping unit 22 to secure the frame 12 about the user, such that the chest pad 16 and back pads 18 are pressured against the user. The chest vibrating device 10 can then be turned on to create vibrations. The vibrations transferred to the chest and back pads 16, 18 are passed onto the lungs

through the chest and back of the user. As shown in Fig. 1, the chest vibrating device 10 can include a controller 112 to vary the intensity of the vibrations to create different strengths of vibrations to clear secreted mucus from the lungs.

[0018] While different embodiments of the invention have been described in detail herein, it will be appreciated by those skilled in the art that various modifications and alternatives to the embodiments could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements are illustrative only and are not limiting as to the scope of the invention that is to be given the full breadth of any and all equivalents thereof.